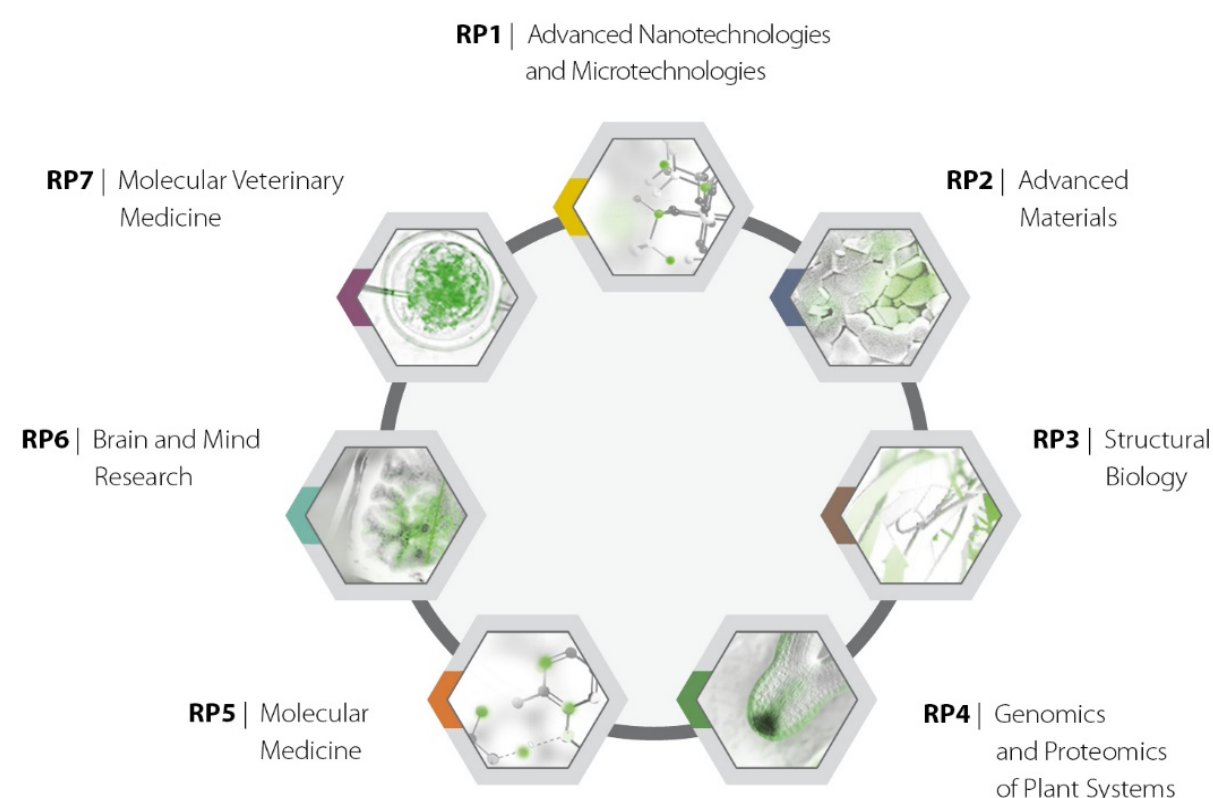
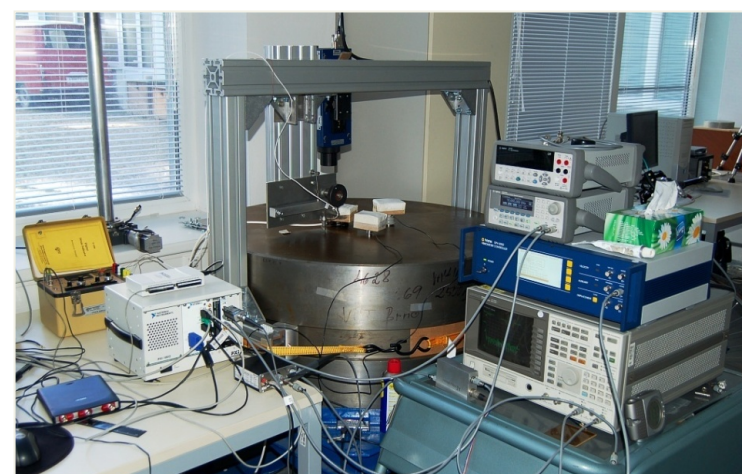


CEITEC – interdisciplinary research center



- Research in material science, ICT and life science
- State-of-the-art research infrastructure and equipment
- Focus on fundamental research as well as applied research and cooperation with industry
- Cybernetics in Material Science – strong focus in cooperation in applied R&D
 - Automatic control algorithms with applications in electrical drives and automotive industry
 - Smart sensors and instrumentation with applications in vibration and noise sensing, acoustic holography, acoustic emission sensors
 - Special electronics and computing HW for signal processing, computer vision and industrial communications

- Mobile robotics for rescue, reconnaissance and service missions. Robotic applications in health care and agriculture
- Examples of running/accepted FP7/H2020 applied R&D projects – collaboration with industry
 - MotorBrain - Nanoelectronics for Electric Vehicle Intelligent Failsafe Power Train
 - EMC² - Embedded multi-core systems for mixed criticality applications in dynamic and changeable real-time environments
 - ACCUS – Adaptive Cooperative Control of Urban Systems
 - 3CCAR - Integrated Components for Complexity Control in affordable electrified cars
 - OSEM-EV - Optimised and Systematic Energy Management in Electric Vehicles
- Extensive experience in research contracts on commercial basis
- Looking for new opportunities for cooperation in R&D projects as well as research contracts



CENTRAL EUROPEAN INSTITUTE OF TECHNOLOGY - CEITEC

Brno University of Technology
Brno, Czech republic

Existing partnerships

Infineon Technologies

Siemens

Fraunhofer

TU Dresden

Ostbayerische Technische Hochschule Amberg-Weiden

Karlsruhe Institute of Technology

Imperial College

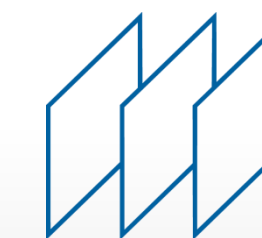
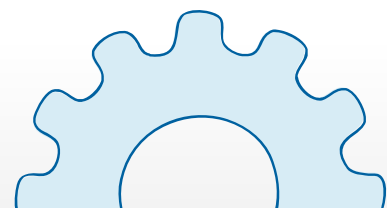
ETH Zurich



Central European Institute of Technology
BRNO | CZECH REPUBLIC

Contact Details

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i.bridge – Intelligent Bridge Surveillance

i.bridge
INTELLIGENT BRIDGES

NEURAL NETWORKS FOR FUTURE BRIDGES

The project i.bridge focuses on the development of a prototype for intelligent bridge surveillance with uses of fiber sensors. A learning neural network hereby analyzes the acquired sensor-data.

The methodology is new in bridge monitoring because the unsupervised learning algorithm is able to identify a damage not just because of exceedance of single threshold values, it takes into account interaction and correlations between numerous sensor signals which is usually require enormous statistic math if standard methods are applied.

The system provides information about the stability of the structure in real-time. In addition, acquired data regarding traffic volume and load condition are available for future reliability and fatigue calculations if desired.

EN PROJEKT VON
pötzl ingenieure gmbh

HOCHSCHULE COBURG

ISAT

DLR

Bundesministerium für Bildung und Forschung

Staatliches Bauamt Bamberg

KIT

Germany, being one of the most important international transit hubs in central Europe, faces the challenges of maintaining the efficiency of its existing infrastructures as well as the upkeep of sufficient capacity to meet the ever increasing demand. Those challenges are tackled through combinations of carefully planned strategies such as building new constructions, expansion of existing highways and railways and timely as well as efficiently maintenance work on infrastructure. This holds especially true for bridges. It is not just because of significant costs that typically involves in maintenance, refurbishment or replacements work. Given the importance of bridges, the cost of maintaining those infrastructures is substantial in order to ensure their continuous functionality, safety and durability. Therefore, it is eminent to recognize any damage or loss potentials as early as possible to keep the cost to a minimum. It is with this goal in mind that a system for monitoring bridge structures in real-time is currently under development. The advantages of this monitoring system is the use of a neural sensor data fusion network with optical fiber sensors (FBG and Rayleigh system) which allows better and faster processing. All sensor data are merged and processed in a suitably programmed neural network. With the help of such a "smart" control bridge it is possible to achieve a self-configuring monitoring system that keeps the operator informed on the actual status of the bridge structure in real-time. This offers a significant potential for savings, because bridges can then be serviced more effectively and better planning can be made. The inconvenience and economically costly traffic closures/detours may therefore be mitigated or even often just eliminated.

Coburg University
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Friedrich-Streib-Straße 2
96450 Coburg, Germany

Sensor Technology
Fiber Optics
Security
Transportation

Pötzl Ingenieure GmbH, Germany
Ci-Tec GmbH, Germany
Karlsruhe Institute of Technology –
Institute for Applied Computer
Science, Germany



COBURG UNIVERSITY
of applied sciences and arts

Contact Details

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Industry 4.0 with Quantitative Open Source Software Engineering

Wolfgang Mauerer

Technical University of Applied Sciences Regensburg
wolfgang.mauerer@oth-regensburg.de

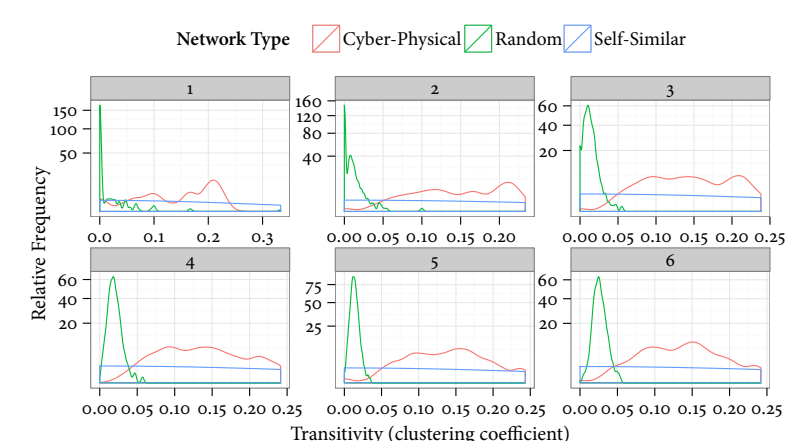
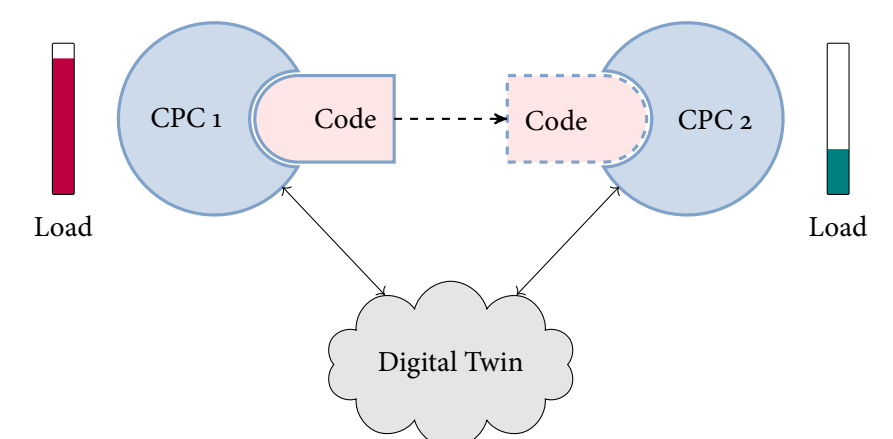


Asymmetric Virtual Computing Platform

Cyber physical systems often face the challenge of having to satisfy two different, conflicting requirements: reaction times to external events need to be as precise as possible (low latency and jitter). Data throughput should be as large as possible when tasks like signal processing are performed. We tackle these issues by integrating asymmetric computational units (FPGAs and GPUs) into CP systems, while providing backwards-compatible upgrade paths. This is augmented by mechanisms to transparently shift computational loads across nodes on the source code level, which provides new levels of flexibility and optimal hardware use.

Cyber Physical Off-The-Shelf

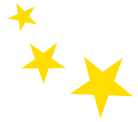
In a project with international industrial partners, we investigate how standard mechanisms of information technology can be judiciously adapted for industrial deployment – products from mass markets ranging from hardware via operating systems to programming languages are shaped for control and automation with structured additive and subtractive engineering techniques.



Codeface

Codeface is an open source (GPLv2 and MIT) framework and interactive web frontend for the social and technical analysis of software development projects. It captures various data sources (revision control systems, bugtracking systems, mailing lists and complexity metrics) to provide a fully automated, parallelised analysis framework that scales to largest projects. It offers a holistic database to coherently integrate all data sources that allows for complex, insightful queries. Finally, it serves as research platform for software engineering using advanced statistical techniques and methods of machine learning on a significant amount of projects, with a particular focus on the cooperative aspects of software engineering.

- M. JOBLIN, WM, S. APEL, J. SIEGMUND, D. RIEHLE: *From Developer Networks to Verified Communities: A Fine-Grained Approach*. Proc. IEEE/ACM Int. Conf. on Software Engineering (ICSE). IEEE Computer Society (2015)
- G. HOFFMANN, D. RIEHLE, C. KOLASSA, WM: *A dual model of Open Source license growth*, IFIP Adv. in Inf. and Comm. Technology, 404, 245–256 (2013)
- WM, M. JÄGER: *Open source engineering processes*, IT special issue 55, 5, 196–203 (2013) 5
- WM, J. SAWALLISCH, G. HILLIER, S. OBERTHÜR, S. HÖNICK, *Real-Time Android: Deterministic Ease of Use*, Proc. Embedded World Conference (2012)



Precision Farming/Smart Farming

The University

The University of Applied Sciences Weihenstephan-Triesdorf focusses on all fields related to agricultural production and the subsequent value chain of food processing and food consumption.

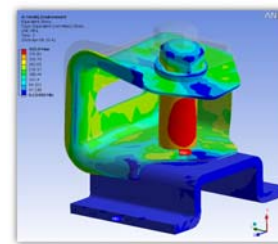
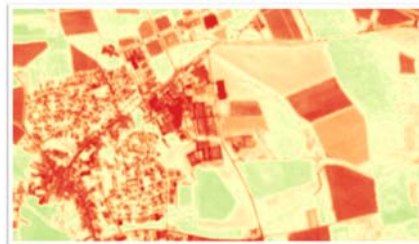
The Bachelor Degree Course Agricultural Engineering

The bachelor degree course on Agricultural Engineering integrates courses on plant production, soil science, plant nutrition and the economy of farming with a profound education in mechanical engineering as well as courses in data processing and mechatronics.

Research Interest

We are especially interested in applied research on all topics related to optimizing the agricultural production process and offer expertise in

- Precision Farming applications
- GIS
- GNSS
- Earth Observation
- design of agricultural machinery
- materials science.



We are looking for partners to develop ideas on monitoring plant growth, soil and weather and/or improving and automating implements and machinery to perform tasks more accurate or efficient.

We can provide test fields next to our university and offer widely spread links into the german agricultural industry.

Hochschule Weihenstephan-Triesdorf

Bavaria / Germany

Precision Farming / Smart Farming

GIS – Farm Management Systems

Earth Observation

GNSS and Steering Systems

UAS (Drones)

Machinery Design

Materials Science

HOCHSCHULE
WEIHENSTEPHAN-TRIEDS
UNIVERSITY OF APPLIED SCIENCES



Contact Details

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Agricultural System Technology

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Join or generate a project: Real Time Ethernet and Combined Data & Power Transfer in Automation and Automotive

We have ongoing projects on combined energy and data transfer as well as in Real-Time Ethernet for automation and automotive applications. We would like to carry on with such work in a European context.

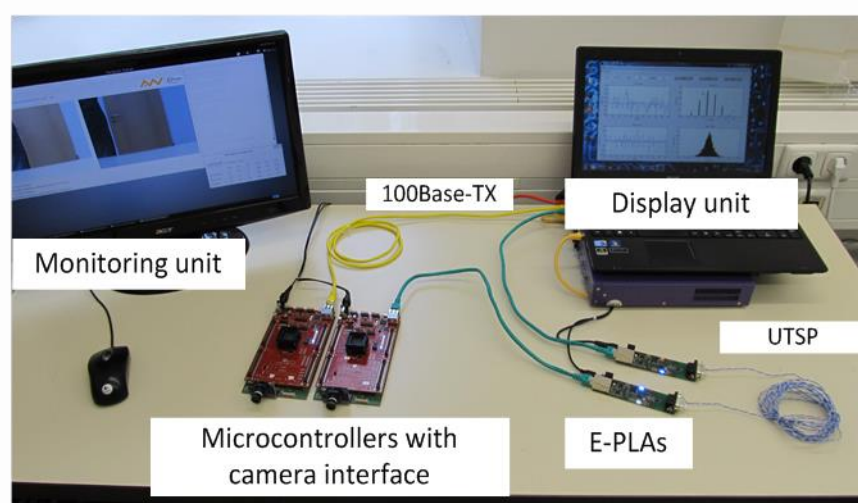
Current work on Ethernet:

Automotive

- Real time stack
- Physical layer

Automation

- Application and adaption of automotive Ethernet in vehicle technologies. E.g. unshielded twisted pair cabling in automation AVB/TSN Stacks for Automation



Electrical testsetup for real-time via one-wire connection

Application Layer	TCP/IP, UDP/IP Application		Ethernet AVB Application
Administration Layer	Mailbox		
Service Layer	TCP, UDP		Ethernet AVB
	IPv4	PTP (1588)	MRP
Administration Layer	RX Mailbox System and TX Message Queues		
Abstraction Layer	RX Handler	Ethernet If	TX Handler
Hardware Layer	Ethernet		

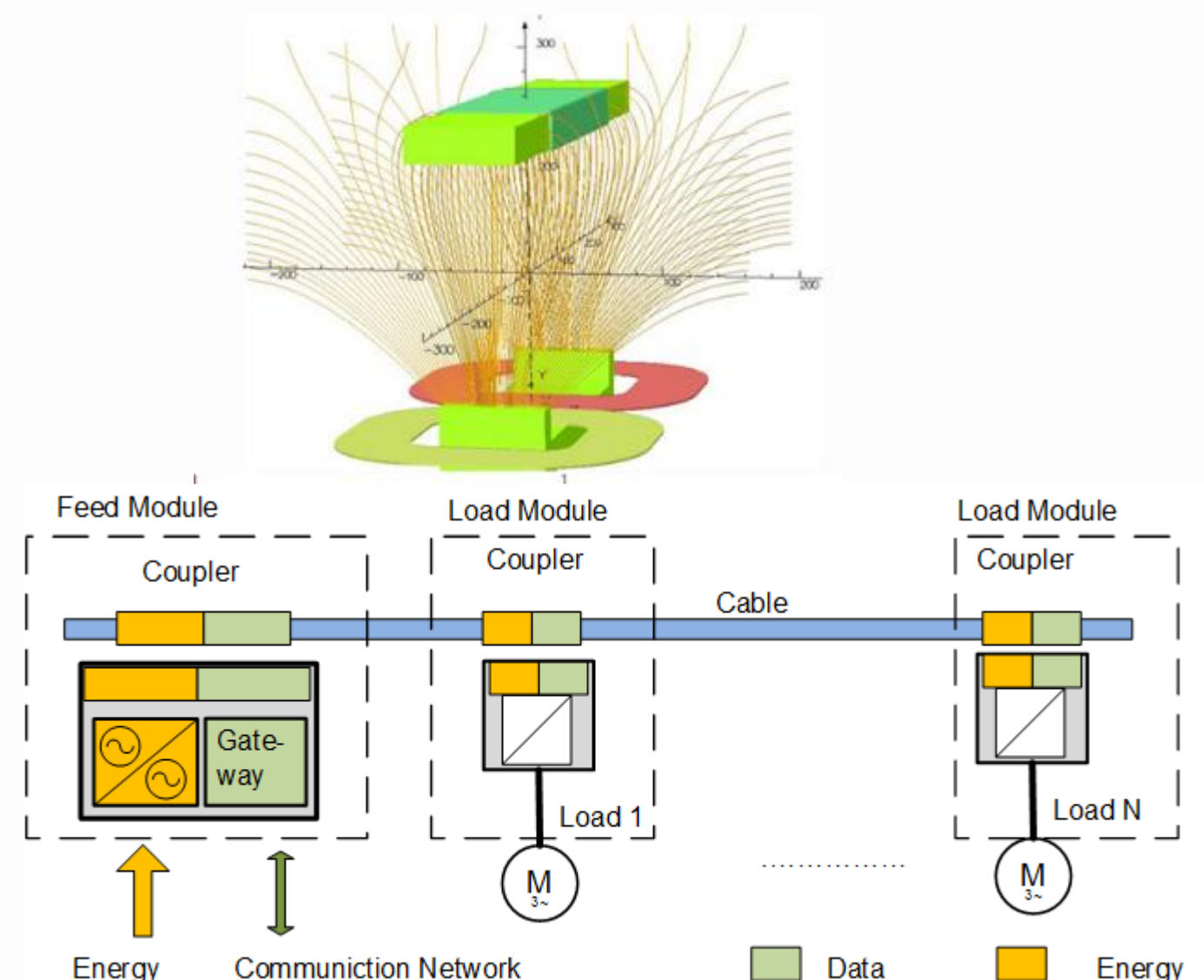
Current work on Power & Data Transfer:

Automotive (E-Mobility wire less charging)

- Coupler Design
- System layout for charging multiple vehicles

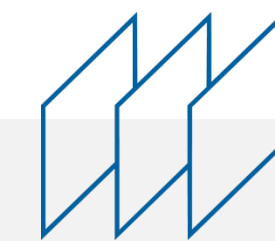
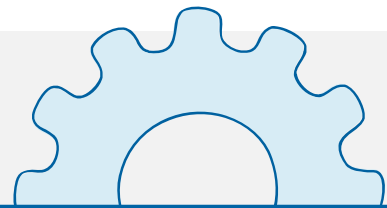
Automation

- Coupler Design for Energy and Data transfer
- System layout, design and simulation



- We would like to join or to develop a project comprising such topics as given below.
- The project should aim at applications in Automotive and/or Automation.
- Scope: Duration 2-4 years; Staff 2 full time; Start in 2016

- Real-Time Ethernet (AVB, TSN, ...)
- Adapted modulation techniques (e.g. OFDM)
- Reduced Twisted Pair Gigabit Ethernet RTPGE
- Data integrity (SW + EMC)
- E-Mobility wireless charging of multiple loads
- Inductive power & Data transfer



BIG DATA ANALYTICS

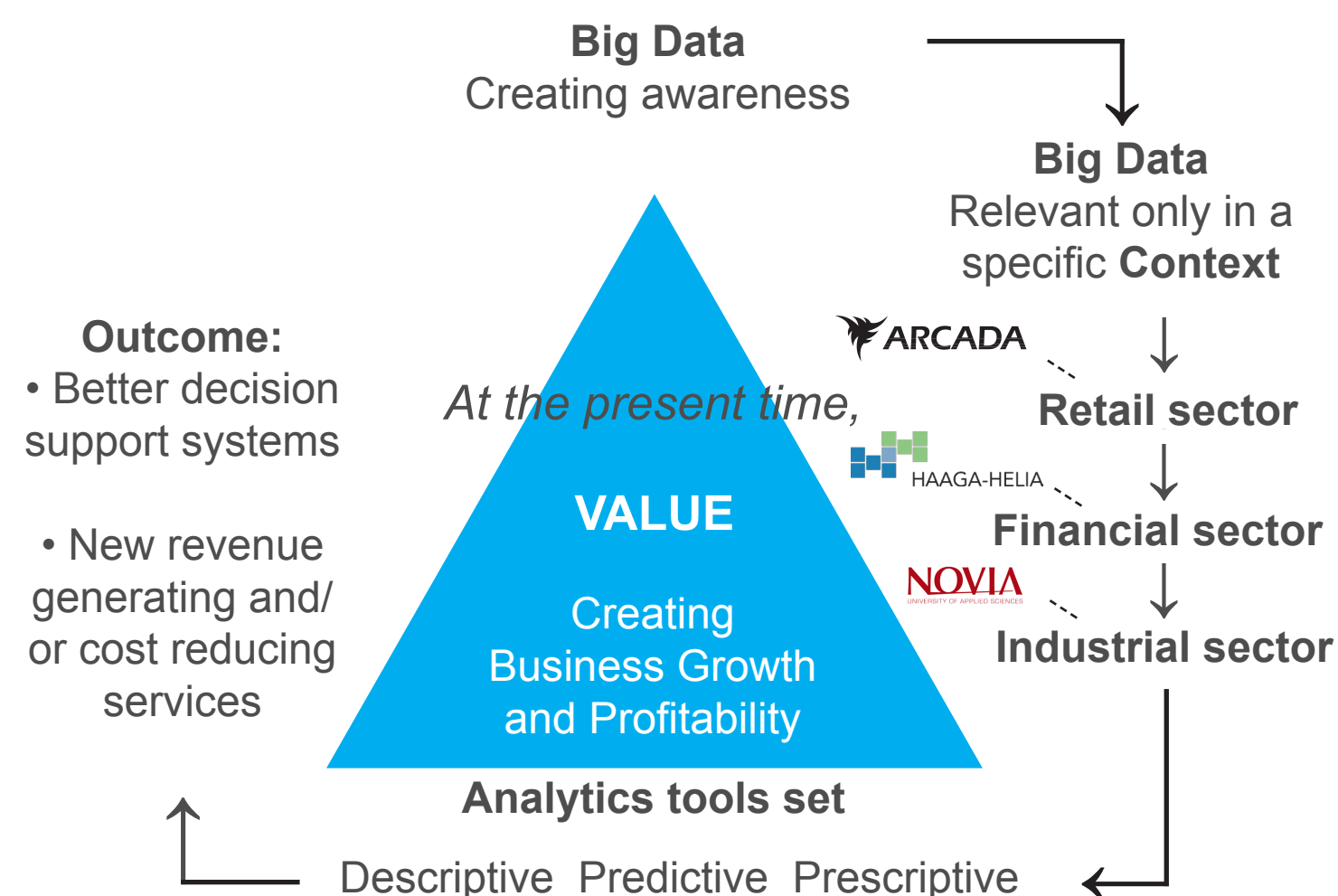
The main aim of the project is to make the digital economy safe and to improve the relevance and quality of decisions.

Big Data Analytics – List of publications and projects obtained (with a strong link to the Big Data Project)

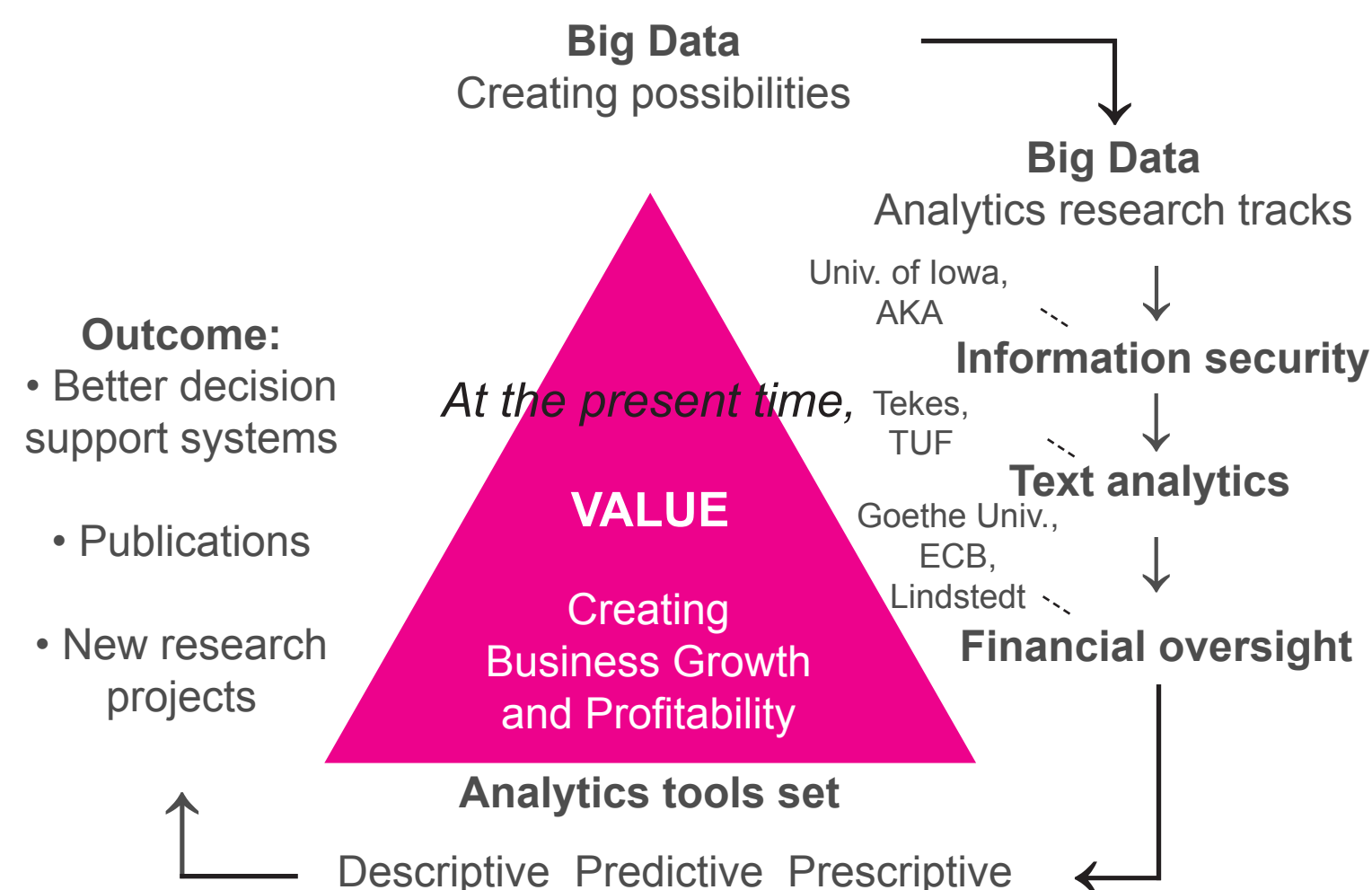
For list of publications, see:
www.arcada.fi/sv/forskning/forskningsprojekt/big-data-analytics
38 publications in 2014.
Approx. half of the articles in JUFO ranked forums.

Projects obtained in 2014
Information Cloud security (Academy of Finland)
Text summarization (Tekes, D2I, Digile)
Financial oversight (A.F. Lindstedt)

Big Data Analytics – A context specific R&D approach (part 1)



Big Data Analytics – Research efforts (part 2)



Arcada University of Applied Sciences

Helsinki, Finland

Research areas:

Culture, functional materials, business development and analytics, patient safety, health promotion and social inclusion

Existing partnerships

The university has numerous national and international partnerships with other universities, companies and organizations. The partnerships are both within the area of education and research.



Contact Details

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